Title/Subject: Performance Criteria and Test Guidelines for Evaluation of Nontraditional Ventilation Controls in Underground Coal Mines		
CDS No.ACRI 5001	Page No. 1 of 5	
Original Issue Date: 11/14/00	Follow-Up Review Date: 9/01/07	Revision Date: 8/31/03
Signature/Initial: Kenneth Sproul, Chief, QA&MTD		

Performance Criteria and Test Guidelines for Evaluation of Nontraditional Ventilation Controls in Underground Coal Mines

1.0 Purpose:

To provide the performance requirements and test guidelines used by MSHA to determine the suitability of ventilation controls, such as overcasts, undercasts, stoppings and regulators that are used in underground coal mines.

2.0 Scope:

This document applies to nontraditional ventilation controls (stoppings, overcasts, undercasts, regulators) for use in underground coal mines. The Code of Federal Regulations (CFR), Title 30, Part 75.333 outlines strength and noncombustibility requirements for ventilation controls such as overcasts and stoppings and regulators.

3.0 References:

3.1 ASTM E72-80, Conducting Strength Tests of Panels for Building Construction.

3.2 ASTM E162-87, Surface Flammability of Materials Using a Radiant Heat Energy Source.

3.3 ASTM E119-88, Test Methods for Fire Tests of Building Construction and Materials.

3.4 American Society of Testing and Materials (ASTM)-1916 Race St., Philadelphia, PA 19103.3.5

3.5 Title 30 Code of Federal Regulations (30 CFR) Part 75.

4.0 Definitions:

4.1 ASTM - American Society for Testing and Materials. A nonprofit organization devoted to the development of voluntary full consensus standards for materials, products, systems, and services and the promotion of related knowledge.

4.2 Company designed application code number - A unique six digit number assigned by the applicant that is used for the tracking of the application paperwork.

4.3 MSHA assigned ID number - An identification number (not an acceptance number) that identifies the formulation of a component that is used in producing a finished product, but made by another manufacturer.

4.4 Noncombustible material - A material that when used to construct a ventilation control, results in a control that will continue to serve its intended function for one hour when subjected to a fire test incorporating an ASTM E119-88, time/temperature heat input, or equivalent.

5.0 Performance Requirements:

5.1 Surface Flame Spread - Sealants applied to ventilation controls must have a flame spread index of 25 or less when tested according to ASTM E-162-87 as specified in Section 6.1.1.

5.1.1 At the discretion of MSHA, other materials used in the construction of a ventilation controls, may be required to demonstrate a flame spread index of 25 or less when tested according to ASTM E-162-87 as specified in Section 6.1.2. Examples of these materials include, but are not limited to, polymers such as plastics and expanded foams.

5.2 Strength - The ventilation control, when tested according to Section 6.2, must display an average transverse strength of at least 39 pounds per square foot.

5.3 Non-combustibility - The ventilation control is tested according to Sections 6.3.1 through 6.3.7 and must meet all of the following:

5.3.1 The control remains in place during the one hour period of the exposure.

5.3.2 The control does not permit the passage of visible flames during the one hour period of the exposure.

5.3.3 Openings in excess of two square inches do not develop in the control during the one hour period of the exposure.

6.0 Testing Guidelines:

6.1 Surface Flammability tests are to be conducted according to ASTM E-162-87.

6.1.1 Sealants: Tests are to be conducted on a minimum of four specimens. The sealant is applied in a thickness of 1/4- inch or greater on a noncombustible substrate most similar in material to the proposed substrate, according to the manufacturer's recommended application method. For example, a high density (90 ± 5 lb/ft^3) inorganic reinforced cement board may be used for sealants that are intended to be used on Portland cement based products.

6.1.2 Construction Materials other than Sealants: [Where required by MSHA] Tests are to be conducted on a minimum of four specimens. The material is tested in the thickness that is to be used - but in any event no greater than one inch - applied over a noncombustible substrate most similar in material to the proposed substrate, according to the manufacturer's recommended application method. For example, a high density (90 ± 5 lb/ft^3) inorganic reinforced cement board may be used for sealants that are intended to be used on Portland cement based products.

6.2 Strength:

Tests are to be conducted according to ASTM E72-80- Section 12, "transverse loading of a vertical specimen." Three specimens are constructed by the applicant or under his direction, using the proposed construction materials and installation instructions. The specimens are not to be cured longer than 28 days prior to testing.

6.3 Non-combustibility:

The applicant must submit results of testing conducted according to ASTM E-119-88 to determine the noncombustible properties of the control.

Testing must be conducted in accordance with the following conditions:

6.3.1 The test control is to be representative of the proposed in-mine construction. The identical materials proposed for the application are to be used in the test construction. Thickness, surface area application, and application method are to be that of the proposed construction.

6.3.3 The minimum cross-sectional area of the test control exposed to the heat source is to be 35 square feet, with the height not less than 3 ft. and the length at least 6 ft.

6.3.4 The test control is installed in the furnace or in front of the exposing heat source with the same geometry and orientation as that proposed for the underground installation.

6.3.5 A positive pressure on the furnace side of at least 0.02 inches of water (gage) is maintained across the control and monitored.

6.3.6. The unexposed surfaces of the control is instrumented with thermocouples as outlined in Section 6 of ASTM E119-88. Temperatures are to be recorded and reported in the lab report. A drawing is to be provided in the test report that identifies location of these thermocouples. Although these data will not be used for determining the rating of the control, they may be used by MSHA engineers to gain additional information concerning the performance of the assembly.

6.3.7 The test exposure is 60 minutes in duration or less if a condition of failure is observed. The temperature-versus-time exposure is to be that of ASTM E119-88 or equivalent.

6.3.8 The test is videotaped with emphasis on the unexposed side of the control. The elapse time of the test is to be superimposed on the video.

6.3.9 A post test fire damage inspection of the control is conducted which includes photographs of both the exposed and unexposed sides of the control and qualitative descriptions of the damage incurred by the fire exposure. These descriptions are to include

recording of extent of damage to the control, char damage, (if combustible constructions are tested) size and locations of any holes or openings that have developed, reporting of areas of the control that have been compromised, characterized by sagging, bending, or other physical damage.

6.3.10 The test report is to include a complete description with drawings of the control and photographs as needed to show details on the construction of the test control.

7.0 Distribution:

Applicants, interested parties, and the Quality Assurance and Materials Testing Division personnel.

8.0 Results:

To provide applicants and interested parties with the performance criteria and testing guidelines used by MSHA to conduct suitability evaluations of nontraditional ventilation controls.

9.0 Review:

Once every three years from the last issue date.

10.0 Authority:

30 CFR Part 75, Sections 75.301 and 75.333

Document Information Form

CDS No. _ACRI 5001 ___ Enter (Original):
(IPSO Assigns) ___ Supersede CDSNo.: ACRI 4005 dated11/14/00)
___ Revise CDS No.:

Title: Performance Criteria and Test Guidelines for Evaluation of Nontraditional Ventilation Controls in Underground Coal Mines

Category: _XX_ A (PAR related) ____ N (Not PAR related)

Type: _CRI_ (POL, SAP, SOP, STP, LEG, INF, CRI)

Sponsoring Division/Center Chief: Ken A. Sproul

Division/Center Contact ____Ken A. Sproul

Document is For:

___ External Distribution
_XX Internal Use Only

List of 30 CFR References:

Part	Section(s)
	All Subparts
__75__	__75.301__
__75__	__75.333__

Key Words: Nontraditional Ventilation Controls, Sealants, ASTM E-162__
(75 Characters)

Follow-Up Review Date: _____9/01/07_____

Comments: Transfer to the Quality Assurance and Material Testing Division

Concurrence:

Technical Review By: _____ Committee Representative

Administrative Review By: _____ Committee Chairperson

Division Chief Concurrence (Initials)

	Yes	No
AED	___	___
ESD	___	___
M&ESD	___	___
QA&MTD	___	___

Authorized By: _____ _____
Name A&CC Chief or Designate Date